



THE *ORYZOMYS SUBFLAVUS* SPECIES GROUP, WITH DESCRIPTION OF TWO NEW SPECIES (RODENTIA, MURIDAE, SIGMODONTINAE) ⁽¹⁾

(With 3 figures)

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ABSTRACT: The sigmodontine rodent *Oryzomys subflavus* (Wagner, 1842) and two new species here described form the so-called *Oryzomys subflavus* species group of the genus *Oryzomys*. This group includes species of medium to large size, with tail longer than head and body, dorsal color changing gradually to the ventral parts, long foot of terrestrial/scansorial type, skull with supraorbital crests well developed and convergent, long and narrow incisive foramina, zygomatic plate projected forward, and posterolateral pits of palate included in a large fossa. The two new species, *Oryzomys scotti* sp.nov. and *Oryzomys maracajuensis* sp.nov., differ in karyotype, in pattern of the lower molars, in pelage of the dorsum and head, in presence or absence of the sphenoidal strut and of sphenopalatine vacuities. Their main habitats are several vegetal formations of the Cerrado and disturbed Atlantic Forest. The geographical distribution of these three species includes mainly the Cerrado and bordering areas of Atlantic Forest and Caatinga Biomes.

Key words: Rodentia; Muridae; Sigmodontinae; *Oryzomys subflavus*; *Oryzomys scotti* sp. nov.; *Oryzomys maracajuensis* sp.nov.; taxonomy.

RESUMO: O grupo de espécies *Oryzomys subflavus*, com descrição de duas espécies novas (Rodentia, Muridae, Sigmodontinae).

O roedor sigmodontíneo *Oryzomys subflavus* (Wagner, 1842) e duas novas espécies aqui descritas constituem o chamado grupo *O. subflavus* dentro do gênero *Oryzomys*. Esse grupo é formado por espécies de tamanho médio a grande, com cauda maior que a cabeça e o corpo, cor do dorso mudando gradualmente para a cor do ventre, pé comprido de tipo terrestre/escansorial, crânio com cristas supraorbitárias desenvolvidas e convergentes, forame incisivo longo e estreito, placa zigomática projetada para frente e fossetas posterolaterais do palato incluídas numa fossa maior. As duas novas espécies, *Oryzomys scotti* sp.nov. e *Oryzomys maracajuensis* sp.nov., diferem no cariótipo, estrutura dos molares inferiores, pelagem do dorso e da cabeça, e presença ou ausência da escora alisfenoidal e de fenestras esfenopalatinas. Seus principais habitats são várias formações vegetais do Cerrado e a Floresta Atlântica degradada. A distribuição geográfica dessas três espécies inclui principalmente o bioma do Cerrado e áreas limítrofes dos biomas da Floresta Atlântica e da Caatinga.

Palavras-chave: Rodentia; Muridae; Sigmodontinae; *Oryzomys subflavus*; *Oryzomys scotti* sp.nov.; *Oryzomys maracajuensis* sp.nov.; taxonomia.

INTRODUCTION

A large karyotypic diversity (2N=48 to 2N=58) proper of interspecific variation has been described within a wide geographic range in Brazil for only one species identified as "*Oryzomys subflavus*" (YONENAGA *et al.*, 1976; KASAHARA & YONENAGA-YASSUDA, 1984; MAIA & HULAK, 1981; ALMEIDA & YONENAGA-YASSUDA, 1985; SVARTMAN, ALMEIDA & CHU, 1988; ZANCHIN, 1988; BONVICINO, OTAZU & BORODIN, 1999).

On the other side, the last taxonomical reviews of the genus *Oryzomys* do not report other species related to the so-called *O. subflavus* (Wagner, 1842) (CABRERA, 1961; MUSSER & CARLETON, 1993; MUSSER *et al.*, 1998). A review of the published karyological data and the study of new specimens from the states of Goiás, Bahia, Minas Gerais, and Mato Grosso do Sul, Brazil, pointed to the need of reassessing the taxonomy of *O. subflavus* and showed unreported species which are formally described here.

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MATERIAL AND METHODS

We examined 49 specimens deposited in the mammal collections of the Museu Nacional - Rio de Janeiro (MN), Universidade Federal da Paraíba, João Pessoa (UFPB), and Universidade de Brasília, Brasília (UnB). Five external measurements were taken from skin labels: head and body (HB), tail length (T), foot length with claw (FC), foot length without claw (FS), ear length (E). The following 21 measurements were taken from skulls, according to HERSHKOVITZ (1990)*, VOSS (1988)**, and MUSSER *et al.* (1998)*** or as defined below: condylo-incisive length** (CIL); breadth at occipital condyles** (BOC); palatilar length* (PL); length of diastema*** (LD); length of palatal bridge*** (LPB); length of incisive foramina*** (LIF); breadth of incisive foramina*** (BIF); alveolar length of upper molar row*** (UMR); breadth of palatal bridge*** (BPB); breadth of first upper molar*** (BM¹); cranial height (CH), measured from dorsal surface of frontal to ventral surface of palatal bones, behind the third molar; length of rostrum*** (LR); length of nasals** (LN); breadth of rostrum*** (BR); least interorbital breadth*** (LIB); length of orbital fossa (LOF), the greatest diameter of orbital fossa; zygomatic breadth*** (ZB); breadth of braincase (BB), measured across the smooth lateral surface of the braincase posterodorsal to the squamosal zygomatic processes; breadth of zygomatic plate*** (BZP); height of mandible (HM), measured from upper side of condyloid process to lower side of angular process; alveolar length of lower molar row (LMR). We measured only adult animals, with all teeth erupted and functional. Cranial and dental measurements were taken with digital calipers.

Cytogenetic analysis was performed in some animals. Bone marrow metaphasic chromosomes were obtained by the modified FORD & HAMERTON (1956) technique and stained with Giemsa or by short-term bone marrow cultures as described by BONVICINO, OTAZU & BORODIN (1999).

RESULTS

The *Oryzomys subflavus* species group

Different species were discovered among specimens hitherto identified as "*O. subflavus*". They share several common characters that define an *O. subflavus* species group as follows: *Oryzomys* of medium to large size, color of body side gradually changing from dorsum to venter, without a well defined separation, tail slightly longer than head and body, with long feet of terrestrial/scansorial

type. Skull with converging supraorbital ridges, long and narrow incisive foramina, long palate as usually found in the genus, with zygomatic plate clearly projecting forward, incisive opisthodont, posterolateral region of palate with pits included in a large fossa. The content of the *O. subflavus* species group is *O. subflavus*, and two new species described below. Differences between karyomorphs mentioned in the literature for "*Oryzomys subflavus*" (see references above) may be responsible for reproductive isolation between populations. We were however unable to find consistent morphological characters that distinguishes all such populations and that justify a formal description of other new species. They may be sibling species. BONVICINO & MOREIRA (2001) analyzed, by distance, parsimony, and maximum-likelihood, 801 bp of the mitochondrial gene cytochrome *b* in "*O. Subflavus*" with different karyomorphs. The resulting molecular phylogeny confirmed that the species mentioned in the present paper together with the bearers of the other karyomorphs mentioned as "*O. subflavus*" in the literature (see above) form a monophyletic group.

Oryzomys subflavus (Wagner, 1842) (Figs. 2A and 3A)

Holotype – Zoologische Staatssammlung München (ZSM) Nrs. 167, 249, and 4B attached in three different labels. Originally a mounted skin with broken skull included; later the skull was removed.

Type-locality – Lagoa Santa, Minas Gerais, Brazil (Fig. 1), by subsequent designation (CABRERA, 1961), since the condition of synonymy with *Mus vulpinus* Lund, 1842, proposed by CABRERA (1961), has been fulfilled (MUSSER *et al.*, 1998). The original labels states "Brasilien" and "Brandt", the last probably the name of a "Naturalien" supplier.

Other specimens examined – BRAZIL: MINAS GERAIS: Lagoa Santa, Sítio no Bairro Quebra (UFPB 1919, 1921, 1928, 2363-2365); Rio das Velhas, 27km NNW of Lagoa Santa (UFPB 1927); Aeroporto de Confins (UFPB 1926); Faz. São Sebastião, 12.2km SW by road from Lagoa Santa (MN 31386); Vargem do Retiro, Ribeirão Mascates, Parque Nacional da Serra do Cipó (MN 31393-31435); Fazenda Cavaia, 17km N, 11km W of Lagoa Santa (UFPB 2062, 2368, 2663-2665). BAHIA: Mata do Aeroporto, Nova Viçosa (MN 61673).

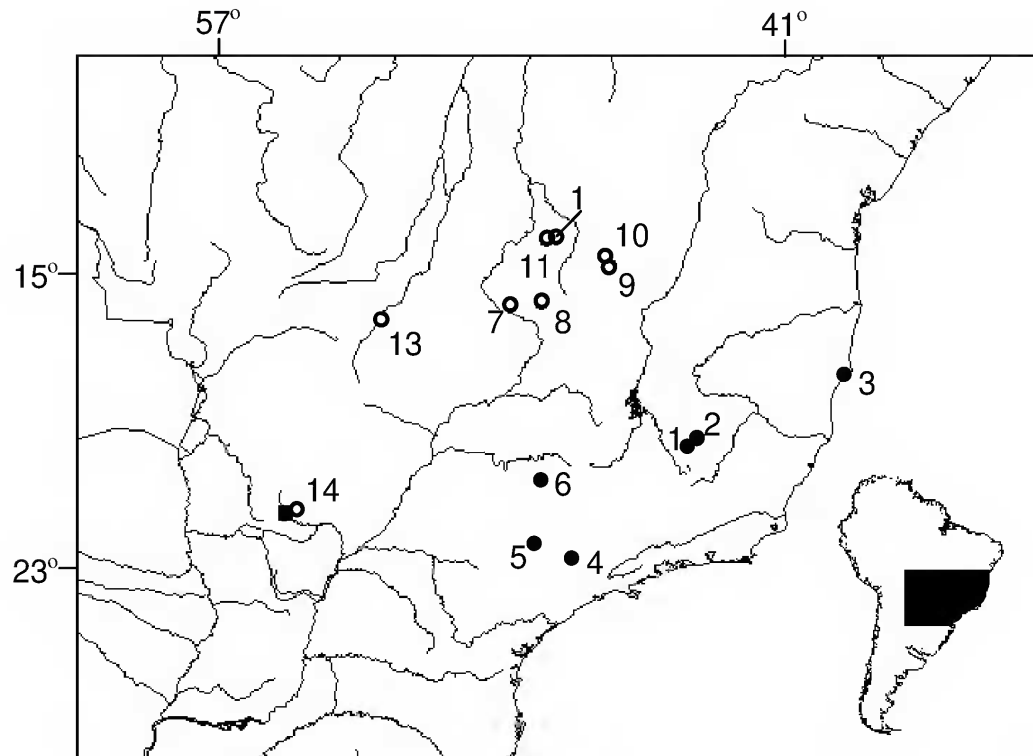


Fig.1- Collecting localities of *Oryzomys subflavus* (●), *O. scotti* sp.nov.(○), and *O. maracajuensis* sp.nov. (■). (1) Lagoa Santa, Rio das Velhas, Aeroporto de Confins, Fazenda São Sebastião, and Fazenda Cavaia, MG. (2) Parque Nacional da Serra do Cipó, MG; (3) Nova Viçosa, BA; (4) Paulínia, SP; (5) Santa Maria da Serra, SP; (6) Itapetininga, SP; (7) Morro dos Cabeludos, Corumbá de Goiás, GO; (8) Área Alfa, and Fazenda Agua Limpa, DF; (9) Fazenda Sertão do Formoso, Jaborandi, BA; (10) Mambai, GO; (11) Fazenda Fiandeira, Cavalcanti, GO; (12) Alto Paraíso de Goiás, GO; (13) Fazenda Bandeirantes, Baliza, GO; (14) Fazenda da Mata, Maracaju, MS.

Description

External characters – Overall dorsal color orange brown slightly lined with black, producing an homogeneous appearance; three kinds of hairs in dorsal region: few long and dark brown guard hairs, banded dorsal overhairs with large pheomelanin band and small eumelanin tip, and the soft orange tipped under hairs, the mixture of black eumelanin guard hairs, and orange pheomelanin over hairs being responsible for the overall color; the dark brown guard hairs give a less lined appearance than in other species of the group; head above grayish anteriorly and with the same color of dorsum in its posterior part; sides of the body light orange, with less dark guard hairs; contrast between lateral and ventral surfaces of the body more defined than in other forms of the group; the ventral pelage is dirty white, slightly overshadowed with yellow, the hairs are bicolored and dark gray at the base; feet grayish, covered by few black and white banded hairs;

tail brown above and unpigmented below, tail tip with few short hairs; internal side of ears with few orange hairs, and anterior half of the external side of pinna lighter at the base, with a dark patch at the top; vibrissae of moderate size, just reaching the tip of the pinna. External measurements are given in table 1.

Cranial characters – Long and narrow incisive foramina, almost reaching anterior lamina of M^1 (Fig.2A); mesopterygoid fossa reaching or not anteriorly the posterior face of M^3 ; one or more posterolateral palatal pits located in a large fossa; zygomatic plate with rounded antero-superior angle; sphenopalatine vacuities present on both sides on presphenoid and basisphenoid; ossified mastoid without fenestra; subsquamosal fenestra small; postglenoid foramen large; strong hamular process of squamosal bone on lateral wall of braincase; squamosoalisphenoid groove absent; alisphenoid strut absent; tegmen tympani well developed and touching the squamosal; interparietal bone transversely

TABLE 1
External measurements of species of the *Oryzomys subflavus* group

MUSEUM NUMBER	SEX	MEASUREMENTS					WEIGHT (g)
		H&B	T	FC	FS	E	
<i>O. subflavus</i>							
ZSM 167 ^{1, 2}	-	162	155	32.5	31.0	16.5	-
UFPB 2062	♀	147	182	35	33	20	95
UFPB 2665	♂	154	167	35	34	20	97
UFPB 2368	♂	156	179	34	32	21	103
UFPB 2664	♀	167	167	33	31	20	91.7
UFPB 2663	♀	154	183	36	34	21	122
UFPB 1927	♂	157	190	36	34	21	-
UFPB 1926	♂	161	190	36	34	20	118
UFPB 1928	♂	118	150	32	30	19	51
UFPB 2364	♂	114	151	33	31	20	46
UFPB 2365	♀	125	158	34	33	20	61
UFPB 2363	♂	113	132	30	29	17	-
UFPB 1921	♂	145	190	34	33	21	82
UFPB 1919	♀	144	188	34	32	21	74
<i>O. maracajuensis</i> sp.nov.							
MN 44178 ¹	♂	154	169	38	36	21	-
MN 4410	♀	165	210	40	-	21	85
MN 4409	♂	180	210	43	-	23	143
<i>O. scotti</i> sp.nov.							
MN 44176 ¹	♀	137	166	34	32	25	79
MN 50380	♀	152	-	33	-	24	126
MN 44177	♀	116	133	30	-	20	54
MN 50306	♂	141	149	32	30	21	-
UFPB 1925	♂	-	-	-	-	-	101.8
UFPB 1917	♀	127	150	31	28	21	54

See text for explanation of measurements abbreviations. (¹) holotype; (²) measurements taken from mounted skin.

smaller than caudal width of parietals; temporal cristae rised; mesolophid present in M₁ and M₂; mandible relatively high, with coronoid process extending dorsally to same height as the condyloid process; concavity of the angular notch more or less deep, and the angular process extending posteriorly to the same plane of the condyloid process. Cranial measurements are given in table 2.

Karyotype – An animal collected near the type locality (UFPB 1926), showed a 2N=54 and FN=62 (Fig.3A). The karyotype is formed by three pairs

of large biarmed chromosomes, two pairs of small biarmed, and 21 pairs of small acrocentric chromosomes. ALMEIDA & YONENAGA-YASSUDA (1985) reported a polymorphism in one of the large biarmed pairs.

Geographic distribution – The species probably occurs in part of the states of Minas Gerais, São Paulo (ALMEIDA & YONENAGA-YASSUDA, 1985), and Bahia, Brazil.

Habitat – This species inhabits disturbed Atlantic Forest, *Cerrado* s.s., and gallery forests in the *Cerrado* biome.

TABLE 2
Cranial measurements of species of the *Oryzomys subflavus* group

Collections number	SEX	MEASUREMENTS																				
		CIL	BOC	PL	LD	LPB	LIF	BIF	UMR	BPB	BM	CH	LR	LN	BR	LIB	LOF	ZB	BB	BZP	HM	LMR
<i>O. subflavus</i>																						
ZSM 167	-	-	-	14.4	9.3	5.8	7.2	-	5.1	-	-	-	12.8	-	5.6	5.7	-	16.4	12.4	3.1	-	4.8
UFPB 2062		34.7	7.1	15.5	10.2	6.3	7.6	2.4	5.2	6.3	1.5	10.6	14.1	14.3	7.1	5.9	13.0	18.6	13.0	4.2	9.1	5.1
UFPB 1927	♂	35.9	7.2	15.7	10.5	6.0	8.1	3.0	5.4	5.7	1.6	11.2	14.2	-	7.5	6.6	13.3	18.8	13.2	4.1	9.3	5.3
UFPB 1926	♂	-	-	16.1	10.8	6.6	8.1	2.9	5.6	7.1	1.6	10.9	14.9	15.1	7.1	6.7	12.7	-	14.2	3.9	-	5.7
UFPB 1928	♂	28.9	7.1	13.2	8.3	5.3	6.3	2.3	5.3	6.2	1.5	9.7	11.3	11.4	5.8	5.8	11.2	16.8	13.1	3.2	7.4	5.2
<i>O. maracajuensis</i> sp.nov.																						
MN 44178	♂	33.0	7.4	14.6	8.8	6.6	7.0	2.4	5.4	6.9	1.5	10.6	13.4	14.6	7.0	6.4	12.9	19.7	13.2	3.5	9.3	5.5
MN 4410		34.0	7.6	16.8	9.6	7.2	7.1	2.7	5.6	6.7	1.6	10.2	12.2	13.7	7.0	6.2	12.8	18.7	13.7	3.7	9.1	5.7
MN 4409	♂	36.3	8.5	16.9	10.4	7.5	7.5	2.8	6.1	6.9	1.6	10.5	12.9	15.0	7.7	6.9	13.9	-	14.1	4.0	10.1	5.5
<i>O. scotti</i> sp.nov.																						
MN 44176		31.7	7.5	14.5	8.6	6.7	6.3	2.3	5.0	6.5	1.5	10.5	12.2	14.4	6.7	5.5	12.8	18.2	13.0	3.3	8.2	4.9
MN 50380		32.0	7.3	14.9	9.3	6.8	6.2	2.3	5.0	6.7	1.5	10.4	12.0	13.6	6.6	5.5	12.9	17.8	13.1	3.0	8.5	4.8
MN 44177		27.7	7.0	-	8.1	6.2	5.6	2.6	4.6	-	1.5	10.4	10.8	-	5.2	11.6	16.6	14.6	2.8	-	-	
MN 50306	♂	29.9	7.0	13.7	7.9	6.1	5.5	2.4	4.9	6.5	1.5	10.3	12.1	13.6	6.7	5.9	12.0	16.7	12.5	3.0	7.9	4.9
UnB 1331	♂	30.1	7.0	13.6	7.9	6.0	6.1	2.5	5.5	6.5	1.6	10.2	12.1	13.0	6.3	5.3	12.7	17.0	12.7	3.0	7.9	5.6
UFPB 1925	♂	33.5	7.4	15.6	8.9	7.2	6.8	2.7	5.4	6.5	1.5	11.4	12.6	14.5	7.1	6.2	14.0	18.2	13.6	3.2	9.3	5.9
UFPB1917		29.6	7.0	13.5	8.2	6.1	6.4	2.5	5.1	6.6	1.5	9.78	11.8	12.8	6.4	5.3	12.2	16.5	12.9	3.4	8.2	5.4

See text for explanation of measurements abbreviations.

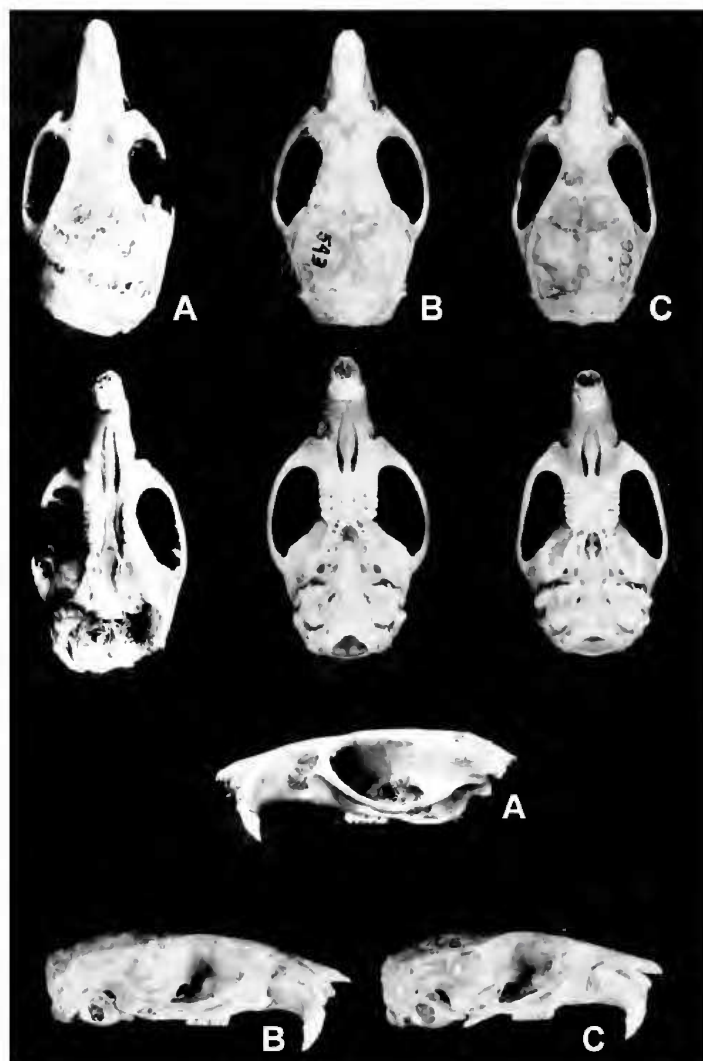


Fig.2- Dorsal, ventral, and lateral views of skull of holotypes of *Oryzomys subflavus* (A), *O. maracajuensis* sp.nov. (B), and *O. scotti* sp.nov. (C).

Remarks –The mounted skin of the holotype is faded and diagnostic color characters are no longer visible. The skull of the same specimen is damaged in the basicranial region. We therefore based our description on complete specimens collected at the type-locality, Lagoa Santa, checking always if the description agrees with the holotype remains.

Oryzomys scotti sp.nov.
(Figs.2C and 3B)

Holotype – BRAZIL - GOIÁS: Municipality of Corumbá de Goiás (approx. 15°54'S, 48°48'W), Morro dos Cabeludos (Fig.1), MN 44176, field number CRB 506 and CO 15, ♀ skin and skull, karyotyped, collected by Scott M. Lindbergh, IX/1991, captive until 16/I/1992.

Paratypes – BRAZIL - GOIÁS: type-locality, MN 50306, field numbers CRB 492 and CO 1, ♂, skin and skull, collected by Scott M. Lindbergh, X/1991, captive until 23/I/1992; MN 44177, field numbers CRB 501 and CO 10, ♀, skin and skull, collected by Scott M. Lindbergh, captive until 28/XII/1991; MN 50380, field numbers CRB 502 and CO 11, ♀, skull only, collected by Scott M. Lindbergh, date unknown; DISTRITO FEDERAL: Brasília, Área Alfa, UnB 1331, field number Pt 186, ♂, skin and skull, collected by Patricia Oliveira, date unknown; Rio Capetinga, Faz. Água Limpa, UNB, 20km SSE of Brasília, UFPB 1925, field number AL 2028, ♂, skin and skull, collected by Alfredo Langguth, 23/VI/1984.

Other specimens examined – BRAZIL: GOIÁS: 3km E of Mambai (UFPB 1917); 14km N of Alto

Paraíso, GPS 14°01'45"S, 47°32'00"W (MN 61684-61685); 5km N of Alto Paraíso, GPS 14°05'15"S, 47°31'30"W (MN 61682, 61686, 61687); Fazenda Fiandeira, 65km SSW de Cavalcanti (MN 61674-61681, 61688); Fazenda Bandeirantes, Rio Lageado, Baliza (UFPB 1911). BAHIA: Fazenda Sertão do Formoso, GPS 14°45'70"S, 45°57'86"W, Jaborandi (MN 61669-61672, 61686). MATO GROSSO DO SUL: Maracaju (MN 4414).

Description

External characters – Overall dorsal color gray olive brown lined with yellow; dorsum homogeneous in color with many dark brown guard hairs, less saturated, yellow olivaceous overhairs, and gray, soft under hairs; the hairs

are arranged in such a way that the general appearance is a fine mixture of colors; light band of overhairs narrower than in the other species of the group, with well-developed eumelanin band in the hair tip; the head has the same color of dorsum; the ventral fur is white grayish, the hairs are bicolor with white tip and gray base; circungential region with completely white hairs; the body sides show less contrast between dorsum and belly than in *O. subflavus*; feet covered with sparse white hairs; tail dark above, contrasting with a light gray bellow, with few hairs at the tip; ears with the usual large dark patch in the antero-superior half of external side of the pinna; vibrissae of moderate size. External measurements are given in table 1.

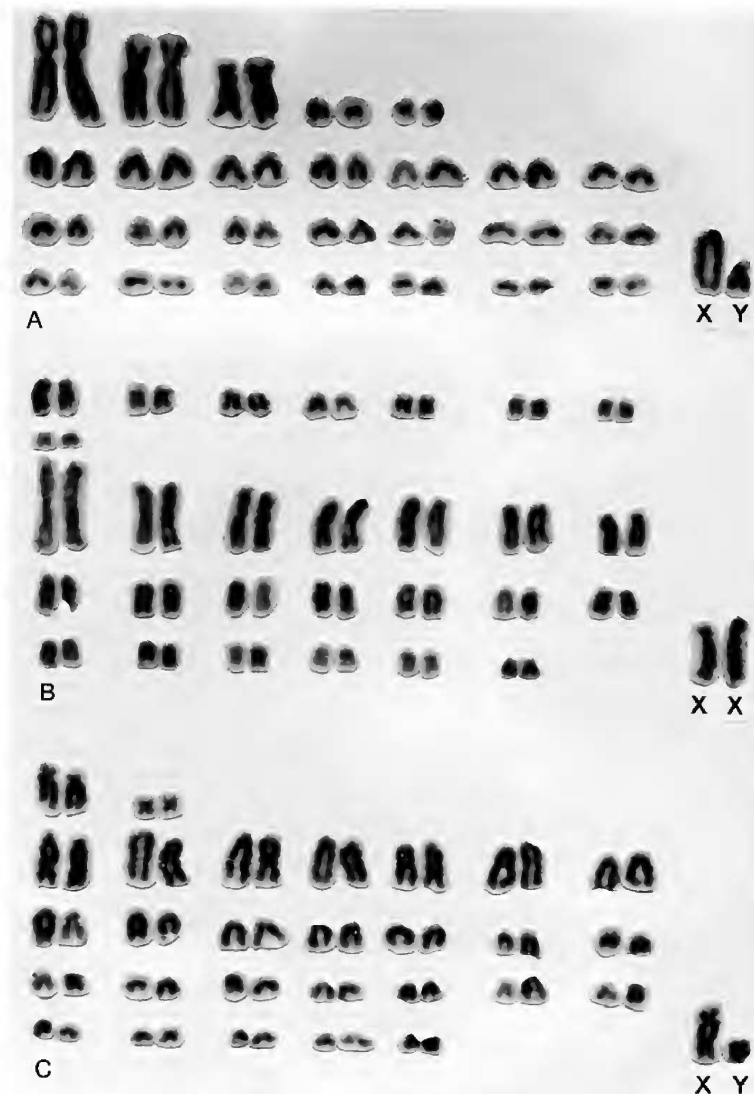


Fig.3- Giemsa karyotypes of *Oryzomys subflavus*, UFPB 1926 (A), *O. scotti* sp.nov., holotype (B), and *O. maracajuensis* sp.nov., holotype (C).

Cranial characters – General characters are those of the *O. subflavus* group described above (Fig.2C); incisive foramina with rounded outer margins not trespassing the anterior lamina of M^1 ; mesopterygoid fossa U-shaped, not reaching the last molar; one or more posterior palatal pits located in a large fossa; zygomatic plate broad, extending forward and forming a distinct zygomatic notch, with antero-superior angle slightly projected forward; sphenopalatine vacuities large; lateral wall of mastoid not perforated by foramina or fenestrae; subsquamosal fenestra very small or absent; postglenoid foramen very large, almost semicircular; a strong hamular process of squamosal bone on lateral wall of braincase; squamosoalisfenoid groove absent; alisphenoid strut present; tegmen tympani poorly developed, usually not touching the squamosal; interparietal bone transversely smaller than caudal width of parietals; temporal cristae raised; mesolophid reduced or absent in M^1 and M^2 ; mandible with a coronoid process extending dorsally to the same height as the condyloid process, outlining a deep sigmoid notch between them; concavity of the angular notch deep; angular process ending anteriorly to the condyloid process. Cranial measurements are given in table 2.

Karyotype – The karyotype of this species (Fig.3B) shows a $2n=58$ and $FN=70-72$, being composed by seven pairs of small biarmed chromosomes, one medium sized subtelocentric, and 20 pairs of acrocentric chromosomes varying in size from large to small. The medium sized subtelocentric is in some metaphases difficult to observe (see also BONVICINO, OTAZU & BORODIN, 1999, fig.2). The X chromosome is a large submetacentric and the Y is a medium sized submetacentric. Two males carried one additional B chromosome. This species corresponds to the *O. subflavus* variant 4 of BONVICINO, OTAZU & BORODIN (1999), who described the G-bands and the synaptonemal complex. SVARTMAN & ALMEIDA (1992) described the karyotype of this species ($2n=58$, $FN=70$) in specimens from the Distrito Federal, Brazil, and also reported a sex chromosomes polymorphism.

Geographic distribution – The species occurs in the Distrito Federal, Southern Goiás and nearby regions of Mato Grosso do Sul and Minas Gerais, Brazil.

Habitat – Animals have been collected in the *vereda*, *campo cerrado*, *cerrado sensu stricto*, and gallery forests of the Cerrado Biome in Central Brazil.

Etymology – The species is named in honor of Scott M. Lindbergh (Brasília) for his significant contribution to Brazilian field Mammalogy.

Oryzomys maracajuensis sp.nov.
(Figs.2B and 3C)

Holotype – BRAZIL - MATO GROSSO DO SUL: Municipality of Maracaju (approx. $21^{\circ}38'S$, $55^{\circ}09'W$) Fazenda da Mata (Fig.1), MN 44178, field number CRB 543, ♂, skin and skull, collected by Cibele R. Bonvicino and Erika D. Hingst, 4/VII/1992.

Paratypes – BRAZIL - MATO GROSSO DO SUL, Maracaju (500m altitude), MN 4410, field number M3870 and MN 4409, field number M3877, both collected by R.M.Gilmore, 26/III/1937 and 3/III/1937, respectively.

Description

External characters – The fur is longer and softer than in the other species of the group; general dorsal color yellowish, strongly lined with black; guard hairs thick, with a very narrow light colored terminal band; overhairs with a large and less saturated pheomelanin band reaching the hair tip; head with the same color of dorsum; body sides lighter with fewer guard hairs and changing gradually into ventral color; belly yellowish, differing from the other species of the group; feet light grayish and covered with short hairs which are white at the tip; tail darker above and slightly lighter below; dark area in the antero-superior part of the external face of the pinna absent; inner side of the pinna covered with thin yellowish hairs; vibrissae of moderate size. External measurements are given in table 1.

Cranial characters – General characters of skull are those of the *O. subflavus* group described above (Fig.2B); incisive foramen with rounded outer margins, posteriorly reaching the level of anterior root of M^1 ; U-shaped, wide mesopterygoid fossa not reaching the last molar; without sphenopalatine vacuities; one or more posterior palatal pits located in a large fossa; zygomatic plate broad, projecting forward and slightly overlapping capsular inflation of nasolacrimal, anterior border slightly concave and antero-superior angle slightly projecting forwards; lateral wall of mastoid with tiny perforations; subsquamosal fenestra small; postglenoid

foramen usually large, approximately semicircular; squamosoalisfenoid groove and alisphenoid strut absent; palatal bridge longer than molar row, projecting backwards for a distance about the length of M^3 ; tegmen tympani poorly developed; interparietal bone transversely broad, nearly equaling caudal width of parietals; temporal cristae flattened, with less convergent supraorbital borders; mesolophid present in M_1 and M_2 ; mandible with the coronoid process extending dorsally to same height as the condyloid process, outlining a deep sigmoid notch between them; concavity of the angular notch more or less deep, and angular process extending posteriorly to the same plane of the condyloid process. Cranial measurements are given in table 2.

Karyotype – The karyotype (Fig.3C) of this species shows a $2n=56$ and $FN=58$, being composed by one medium sized subtelocentric, a small metacentric, and 25 pairs of acrocentric chromosomes varying in size from large to small. The X chromosome is a large submetacentric and the Y, a small metacentric.

Geographic distribution – Known only from type locality (Fig.1). Probably the animals that MYERS (1982) collected in Paraguay and identified as *O. subflavus* belong to *O. maracajuensis* sp.nov. The species probably occurs in eastern Mato Grosso do Sul, Brazil, and Paraguay, East of the Rio Paraguay.

Habitat – The holotype was collected in gallery forests of the *Cerrado* Biome, the other specimens were collected “in bush and grass”.

Etymology – From Maracaju, type-locality of the species.

Remarks – This is one of the several species that may match the description of Azara’s “rat troisième”, the basis of the name *Mus angouya* Fisher, 1814. Azara’s rat is, actually, unidentifiable and it is regrettable that MUSSER *et al.* (1998) designed a neotype for *M. angouya* of the same species of *Oryzomys ratticeps* (Hensel, 1873). The last is a frequently used and familiar name to taxonomists that now disappears in the synonymy. The name is so familiar that MUSSER *et al.* (1998) designate the neotype of *Mus angouya* Fisher, 1814 and place the name *Hesperomys ratticeps* Hensel, 1872 in the synonymy of the former on page 300 but still use the name *O. ratticeps* on the following pages 301-303. The specimen shown in fig.142 by MUSSER *et al.* (1998) as *O. subflavus* is an *O. maracajuensis* sp.nov.

COMMENTS

There are three distinct color patterns in the *Oryzomys subflavus* species group: the overall orange color of the dorsum and gray head of *O. subflavus*, the dark dorsal color lined with yellow of *O. scotti* sp.nov., without gray in the anterior region of head, and the pattern of *O. maracajuensis* sp.nov. that has more yellowish overall dorsal color, lined with black. Some skull characters distinguish the three species: sphenopalatine vacuities present on pre- and basisphenoid in *O. subflavus* and *O. scotti* sp.nov. but absent in *O. maracajuensis* sp.nov.; alisphenoid strut absent in *O. subflavus* and *O. maracajuensis* but present in *O. scotti*; mesolophid present in M_1 and M_2 of *O. subflavus* and *O. maracajuensis* sp.nov. but reduced or absent in *O. scotti* sp.nov.

The geographic distribution show that these species are mainly allopatric but *O. scotti* sp.nov. and *O. maracajuensis* sp.nov. are sympatric in Maracaju. They may be found in open as well as in forest formations associated with disturbed vegetation. *Oryzomys scotti* sp.nov., *O. maracajuensis* sp.nov., and *O. subflavus* occur mainly in the *Cerrado* Biome.

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